



US009176535B2

(12) **United States Patent**
Bohn et al.

(10) **Patent No.:** **US 9,176,535 B2**
(45) **Date of Patent:** **Nov. 3, 2015**

(54) **FLEXIBLE DISPLAY FLEXURE ASSEMBLY**

(75) Inventors: **David D. Bohn**, Fort Collins, CO (US);
Rod G. Fleck, Bellevue, WA (US)

(73) Assignee: **Microsoft Technology Licensing, LLC**,
Redmond, WA (US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 527 days.

6,016,176 A	1/2000	Kim et al.
6,170,120 B1	1/2001	Lu
6,230,365 B1	5/2001	Lu
6,421,235 B2 *	7/2002	Ditzik 361/679.3
6,563,700 B1	5/2003	Waller et al.
6,577,496 B1	6/2003	Gioscia et al.
6,751,473 B1	6/2004	Goyal et al.
6,859,357 B2	2/2005	Morimoto et al.
7,127,776 B2	10/2006	Park
7,200,224 B2	4/2007	Park et al.

(Continued)

FOREIGN PATENT DOCUMENTS

(21) Appl. No.: **13/152,828**

KR	100867608	11/2008
WO	WO-2009131447	10/2009

(22) Filed: **Jun. 3, 2011**

OTHER PUBLICATIONS

(65) **Prior Publication Data**

US 2012/0307423 A1 Dec. 6, 2012

"Non-Final Office Action", U.S. Appl. No. 13/153,092, (Feb. 11, 2013), 17 pages.

(Continued)

(51) **Int. Cl.**

G06F 1/16	(2006.01)
E05D 15/00	(2006.01)
E05D 11/06	(2006.01)
H04M 1/02	(2006.01)

Primary Examiner — Nidhi Thaker

(74) *Attorney, Agent, or Firm* — Jeremy Snodgrass; Judy Yee; Micky Minhas

(52) **U.S. Cl.**

CPC **G06F 1/1641** (2013.01); **G06F 1/1652**
(2013.01); **G06F 1/1681** (2013.01); **H04M**
1/0216 (2013.01); **H04M 1/0268** (2013.01)

(58) **Field of Classification Search**

CPC G06F 1/1652; G06F 1/1641; G06F 1/1681
USPC 361/679.01–679.45, 679.55–679.59;
345/156, 157, 168, 169, 905;
455/575.1, 575.3, 575.4; 16/368, 369,
16/371

See application file for complete search history.

(57)

ABSTRACT

In embodiments of a flexible display flexure assembly, a flexure assembly includes a structure of pivotable links that couples first and second housing parts of a foldable electronic device. The first housing part of the foldable electronic device includes a flexible display, and the first housing part is integrated with a first section of the flexible display. The second housing part of the foldable electronic device is integrated with a second section of the flexible display. The pivotable links are implemented to collapse relative to each other to form a bend radius of the flexible display and support the flexible display in a closed position of the foldable electronic device. The structure of the pivotable links is also implemented to support the flexible display in an open position of the foldable electronic device.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,712,760 A	1/1998	Coulon et al.
6,006,243 A	12/1999	Karidis

20 Claims, 8 Drawing Sheets

